



# SEQUENCE LISTING

<110> Hastings, et al.

<120> Novel Hyaluronan-Binding Proteins and Encoding Genes

<130> PF487

<140> 09/466,778

<141> 1999-12-20

<150> 60/113,871

<151> 1998-12-23

<160> 37

<170> PatentIn Ver. 2.0

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Ser Cys Arg Ala Arg Asn Pro Cys Thr Asp Gly His Arg Gly Gly Cys	1720	1725	1730	
agc gag cac gcc aac tgc ttg agc acc ggc ctg aac aca cgg cgc tgt				5410
Ser Glu His Ala Asn Cys Leu Ser Thr Gly Leu Asn Thr Arg Arg Cys	1735	1740	1745	
gag tgc cac gca ggc tac gta ggc gat gga ctg cag tgt ctg gag gag				5458
Glu Cys His Ala Gly Tyr Val Gly Asp Gly Leu Gln Cys Leu Glu Glu	1750	1755	1760	
tcg gaa cca cct gtg gac cgc tgc ttg ggc cag cca ccg ccc tgc cac				5506
Ser Glu Pro Pro Val Asp Arg Cys Leu Gly Gln Pro Pro Cys His	1765	1770	1775	
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Ser Asp Ala Met Cys Thr Asp Leu His Phe Gln Glu Lys Arg Ala Gly	1780	1785	1790	1795
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Val Phe His Leu Gln Ala Thr Ser Gly Pro Tyr Gly Leu Asn Phe Ser	1800	1805	1810	
gag gct gag gcg gca tgc gaa gca cag gga gcc gtc ctt gct tca ttc				5650
Glu Ala Glu Ala Ala Cys Glu Ala Gln Gly Ala Val Leu Ala Ser Phe	1815	1820	1825	
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Pro Gln Leu Ser Ala Ala Gln Gln Leu Gly Phe His Leu Cys Leu Met	1830	1835	1840	
ggc tgg ctg gcc aat ggc tcc act gcc cac cct gtg gtt ttc cct gtg				5746
Gly Trp Leu Ala Asn Gly Ser Thr Ala His Pro Val Val Phe Pro Val	1845	1850	1855	
gcg gac tgt ggc aat ggt cgg gtg ggc ata gtc agc ctg ggt gcc cgc				5794
Ala Asp Cys Gly Asn Gly Arg Val Gly Ile Val Ser Leu Gly Ala Arg	1860	1865	1870	1875
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Lys Asn Leu Ser Glu Arg Trp Asp Ala Tyr Cys Phe Arg Val Gln Asp	1880	1885	1890	
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Val Ala Cys Arg Cys Arg Asn Gly Phe Val Gly Asp Gly Ile Ser Thr	1895	1900	1905	
tgc aat ggg aag ctg ctg gat gtg ctg gct gcc act gcc aac ttc tcc				5938
Cys Asn Gly Lys Leu Leu Asp Val Leu Ala Ala Thr Ala Asn Phe Ser	1910	1915	1920	
acc ttc tat ggg atg cta ttg ggc tat gcc aat gcc acc cag cgg ggt				5986
Thr Phe Tyr Gly Met Leu Leu Gly Tyr Ala Asn Ala Thr Gln Arg Gly	1925	1930	1935	
ctc gac ttc ctg gac ttc ctg gat gat gag ctc acg tat aag aca ctc				6034
Leu Asp Phe Leu Asp Phe Leu Asp Asp Glu Leu Thr Tyr Lys Thr Leu	1940	1945	1950	1955
ttc gtc cct gtc aat gaa ggc ttt gtg gac aac atg acg ctg agt ggc				6082
Phe Val Pro Val Asn Glu Gly Phe Val Asp Asn Met Thr Leu Ser Gly				

1960	1965	1970	
cca aac ttg gag ctg cat gcc tcc aac gcc acc ctc cta agt gcc aac Pro Asn Leu Glu Leu His Ala Ser Asn Ala Thr Leu Leu Ser Ala Asn 1975 1980 1985			6130
gcc agc cag ggg aag ttg ctt ccg gcc cac tca ggc ctc agc ctc atc Ala Ser Gln Gly Lys Leu Leu Pro Ala His Ser Gly Leu Ser Leu Ile 1990 1995 2000			6178
atc agt gac gca ggc cct gac aac agt tcc tgg gcc cct gtg gcc cca Ile Ser Asp Ala Gly Pro Asp Asn Ser Ser Trp Ala Pro Val Ala Pro 2005 2010 2015			6226
ggg aca gtt gtg gtt agc cgt atc att gtg tgg gac atc atg gcc ttc Gly Thr Val Val Val Ser Arg Ile Ile Val Trp Asp Ile Met Ala Phe 2020 2025 2030 2035			6274
aat ggc atc atc cat gct ctg gcc agc ccc ctc ctg gca ccc cca cag Asn Gly Ile Ile His Ala Leu Ala Ser Pro Leu Leu Ala Pro Pro Gln 2040 2045 2050			6322
ccc cag gca gtg ctg gcg cnt gaa gcc cca cct gtg gcg gca ggc gtg Pro Gln Ala Val Leu Ala Xaa Glu Ala Pro Pro Val Ala Ala Gly Val 2055 2060 2065			6370
ggg gct gtg ctt gcc gct gga gca ctg ctt ggc ttg gtg gcc gga gct Gly Ala Val Leu Ala Ala Gly Ala Leu Leu Gly Leu Val Ala Gly Ala 2070 2075 2080			6418
ctc tac ctc cgt gcc cga ggc aag ccc atg ggc ttt ggc ttc tct gcc Leu Tyr Leu Arg Ala Arg Gly Lys Pro Met Gly Phe Gly Phe Ser Ala 2085 2090 2095			6466
ttc cag gcg gaa gat gat gct gat gac gan ttc tca ccg tgg caa gaa Phe Gln Ala Glu Asp Asp Ala Asp Asp Xaa Phe Ser Pro Trp Gln Glu 2100 2105 2110 2115			6514
ggg acc aac ccc acn ttg gtn tnt gtc ccc aac cct gtc ttt ggc agc Gly Thr Asn Pro Xaa Leu Xaa Xaa Val Pro Asn Pro Val Phe Gly Ser 2120 2125 2130			6562
gac acc ttt tgt gaa ccc ttc gat gac tca ctg ctg gag gag gac ttc Asp Thr Phe Cys Glu Pro Phe Asp Asp Ser Leu Leu Glu Glu Asp Phe 2135 2140 2145			6610
cct gac acc cag agg atc ctc aca gtc aag tga cgaggctggg gctgaaagca Pro Asp Thr Gln Arg Ile Leu Thr Val Lys 2150 2155			6663
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          35          40          45
His Ile Leu Glu Asp Thr Arg Thr Gln Gln Thr Arg Arg Trp Trp Thr
          50          55          60
Leu Ala Gly Gln Glu Ile Thr Val Thr Phe Asn Gln Phe Thr Lys Tyr
          65          70          75          80
Ser Tyr Lys Tyr Lys Asp Gln Pro Gln Gln Thr Phe Asn Ile Tyr Lys
          85          90          95
Ala Asn Asn Ile Ala Ala Asn Gly Val Phe His Val Val Thr Gly Leu
          100          105          110
Arg Trp Gln Ala Pro Ser Gly Thr Pro Gly Asp Pro Lys Arg Thr Ile
          115          120          125
Gly Gln Ile Leu Ala Ser Thr Glu Ala Phe Ser Arg Phe Glu Thr Ile
          130          135          140
Leu Glu Asn Cys Gly Leu Pro Ser Ile Leu Asp Gly Pro Gly Pro Phe
          145          150          155          160
Thr Val Phe Ala Pro Ser Asn Glu Ala Val Asp Ser Leu Arg Asp Gly
          165          170          175
Arg Leu Ile Tyr Leu Phe Thr Ala Gly Leu Ser Lys Leu Gln Glu Leu
          180          185          190
Val Arg Tyr His Ile Tyr Asn His Gly Gln Leu Thr Val Glu Lys Leu
          195          200          205
Ile Ser Lys Gly Arg Ile Leu Thr Met Ala Asn Gln Val Leu Ala Val
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Asn Ile Ser Glu Glu Gly Arg Ile Leu Leu Gly Pro Glu Gly Val Pro  
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 Leu Gln Arg Val Asp Val Met Ala Ala Asn Gly Val Ile His Met Leu  
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 Asp Gly Ile Leu Leu Pro Pro Thr Ile Leu Pro Ile Leu Pro Lys His  
 260 265 270  
 Cys Ser Glu Glu Gln His Lys Ile Val Ala Gly Ser Cys Val Asp Cys  
 275 280 285  
 Gln Ala Leu Asn Thr Ser Thr Cys Pro Pro Asn Ser Val Lys Leu Asp  
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 Ile Phe Pro Lys Glu Cys Val Tyr Ile His Asp Pro Thr Gly Leu Asn  
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 Val Leu Lys Lys Gly Cys Ala Ser Tyr Cys Asn Gln Thr Ile Met Glu  
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 405 410 415  
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 His Cys His Leu His Ala Arg Cys Val Ser Gln Glu Gly Val Ala Arg  
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 485 490 495  
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 515 520 525  
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 Gly Pro Gly Gln Ser Arg Cys Thr Cys Lys Leu Gly Phe Ala Gly Asp  
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 Gly Tyr Gln Cys Ser Pro Ile Asp Pro Cys Arg Ala Gly Asn Gly Gly



Gly Thr Leu Cys Glu Pro Cys Pro Gly Gly Leu Gly Gly Val Cys Ser  
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 930 935 940  
 Cys His Glu Gly Phe His Gly Thr Ala Cys Glu Val Cys Glu Leu Gly  
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 Arg Tyr Gly Pro Asn Cys Thr Gly Val Cys Asp Cys Ala His Gly Leu  
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 1380 1385 1390  
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 1475 1480 1485  
 Gln Gly Ser Pro Glu Ala Cys Trp Arg Phe Tyr Pro Lys Phe Trp Thr  
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Leu Glu Glu Ser Glu Pro Pro Val Asp Arg Cys Leu Gly Gln Pro Pro 1765 1770 1775			
Pro Cys His Ser Asp Ala Met Cys Thr Asp Leu His Phe Gln Glu Lys 1780 1785 1790			
Arg Ala Gly Val Phe His Leu Gln Ala Thr Ser Gly Pro Tyr Gly Leu 1795 1800 1805			
Asn Phe Ser Glu Ala Glu Ala Ala Cys Glu Ala Gln Gly Ala Val Leu 1810 1815 1820			
Ala Ser Phe Pro Gln Leu Ser Ala Ala Gln Gln Leu Gly Phe His Leu 1825 1830 1835 1840			
Cys Leu Met Gly Trp Leu Ala Asn Gly Ser Thr Ala His Pro Val Val 1845 1850 1855			
Phe Pro Val Ala Asp Cys Gly Asn Gly Arg Val Gly Ile Val Ser Leu 1860 1865 1870			
Gly Ala Arg Lys Asn Leu Ser Glu Arg Trp Asp Ala Tyr Cys Phe Arg 1875 1880 1885			
Val Gln Asp Val Ala Cys Arg Cys Arg Asn Gly Phe Val Gly Asp Gly 1890 1895 1900			
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Asn Phe Ser Thr Phe Tyr Gly Met Leu Leu Gly Tyr Ala Asn Ala Thr 1925 1930 1935			



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 Lys Thr Leu Phe Val Pro Val Asn Glu Gly Phe Val Asp Asn Met Thr  
 1955 1960 1965  
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 1985 1990 1995 2000  
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Asp Gly His Arg Gly Gly Cys Ser Glu His Ala Asn Cys Leu Ser Thr
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His Pro Val Val Phe Pro Val Ala Asp Cys Gly Asn Gly Arg Val Gly
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gct gcc act gcc aac ttc tcc acc ttc tat ggg atg cta ttg ggc tat Ala Ala Thr Asn Phe Ser Thr Phe Tyr Gly Met Leu Leu Gly Tyr 220 225 230	726
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ctt ggc ttg gtg gcc gga gct ctc tac ctc cgt gcc cga ggc aag ccc Leu Gly Leu Val Ala Gly Ala Leu Tyr Leu Arg Ala Arg Gly Lys Pro 380 385 390	1206
atg ggc ttt ggc ttc tct gcc ttc cag gcg gaa gat gat gct gat gac Met Gly Phe Gly Phe Ser Ala Phe Gln Ala Glu Asp Ala Asp Asp 395 400 405	1254
gan ttc tca ccg tgg caa gaa ggg acc aac ccc acn ttg gtn tnt gtc Xaa Phe Ser Pro Trp Gln Glu Gly Thr Asn Pro Xaa Leu Xaa Xaa Val 410 415 420	1302

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ccc aac cct gtc ttt ggc agc gac acc ttt tgt gaa ccc ttc gat gac 1350
Pro Asn Pro Val Phe Gly Ser Asp Thr Phe Cys Glu Pro Phe Asp Asp
425 430 435 440

tca ctg ctg gag gag gac ttc cct gac acc cag agg atc ctc aca gtc 1398
Ser Leu Leu Glu Glu Asp Phe Pro Asp Thr Gln Arg Ile Leu Thr Val
445 450 455

aag tga cgaggctggg gctgaaagca gaagcatgca cagggaggag accantttta 1454
Lys

ttgcttgtct ggggtggatgg ggcaggaggg nctgagggcc tgtcccagac aatannngtn 1514

ccctcgag 1522

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<210> 5
<211> 457
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<213> Homo sapiens

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 1 5 10 15

Cys Arg Ala Arg Asn Pro Cys Thr Asp Gly His Arg Gly Gly Cys Ser
 20 25 30

Glu His Ala Asn Cys Leu Ser Thr Gly Leu Asn Thr Arg Arg Cys Glu
 35 40 45

Cys His Ala Gly Tyr Val Gly Asp Gly Leu Gln Cys Leu Glu Glu Ser
 50 55 60

Glu Pro Pro Val Asp Arg Cys Leu Gly Gln Pro Pro Pro Cys His Ser
 65 70 75 80

Asp Ala Met Cys Thr Asp Leu His Phe Gln Glu Lys Arg Ala Gly Val

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85										90					95				
Phe	His	Leu	Gln	Ala	Thr	Ser	Gly	Pro	Tyr	Gly	Leu	Asn	Phe	Ser	Glu				
			100					105					110						
Ala	Glu	Ala	Ala	Cys	Glu	Ala	Gln	Gly	Ala	Val	Leu	Ala	Ser	Phe	Pro				
		115					120					125							
Gln	Leu	Ser	Ala	Ala	Gln	Gln	Leu	Gly	Phe	His	Leu	Cys	Leu	Met	Gly				
	130					135					140								
Trp	Leu	Ala	Asn	Gly	Ser	Thr	Ala	His	Pro	Val	Val	Phe	Pro	Val	Ala				
145					150					155					160				
Asp	Cys	Gly	Asn	Gly	Arg	Val	Gly	Ile	Val	Ser	Leu	Gly	Ala	Arg	Lys				
			165						170					175					
Asn	Leu	Ser	Glu	Arg	Trp	Asp	Ala	Tyr	Cys	Phe	Arg	Val	Gln	Asp	Val				
			180					185					190						
Ala	Cys	Arg	Cys	Arg	Asn	Gly	Phe	Val	Gly	Asp	Gly	Ile	Ser	Thr	Cys				
		195					200					205							
Asn	Gly	Lys	Leu	Leu	Asp	Val	Leu	Ala	Ala	Thr	Ala	Asn	Phe	Ser	Thr				
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Phe	Tyr	Gly	Met	Leu	Leu	Gly	Tyr	Ala	Asn	Ala	Thr	Gln	Arg	Gly	Leu				
225					230				235						240				
Asp	Phe	Leu	Asp	Phe	Leu	Asp	Asp	Glu	Leu	Thr	Tyr	Lys	Thr	Leu	Phe				
				245				250						255					
Val	Pro	Val	Asn	Glu	Gly	Phe	Val	Asp	Asn	Met	Thr	Leu	Ser	Gly	Pro				
			260					265					270						
Asn	Leu	Glu	Leu	His	Ala	Ser	Asn	Ala	Thr	Leu	Leu	Ser	Ala	Asn	Ala				
		275					280					285							
Ser	Gln	Gly	Lys	Leu	Leu	Pro	Ala	His	Ser	Gly	Leu	Ser	Leu	Ile	Ile				
	290					295					300								
Ser	Asp	Ala	Gly	Pro	Asp	Asn	Ser	Ser	Trp	Ala	Pro	Val	Ala	Pro	Gly				
305					310					315					320				
Thr	Val	Val	Val	Ser	Arg	Ile	Ile	Val	Trp	Asp	Ile	Met	Ala	Phe	Asn				
				325					330				335						
Gly	Ile	Ile	His	Ala	Leu	Ala	Ser	Pro	Leu	Leu	Ala	Pro	Pro	Gln	Pro				
			340					345					350						
Gln	Ala	Val	Leu	Ala	Xaa	Glu	Ala	Pro	Pro	Val	Ala	Ala	Gly	Val	Gly				
		355				360						365							
Ala	Val	Leu	Ala	Ala	Gly	Ala	Leu	Leu	Gly	Leu	Val	Ala	Gly	Ala	Leu				
		370				375					380								
Tyr	Leu	Arg	Ala	Arg	Gly	Lys	Pro	Met	Gly	Phe	Gly	Phe	Ser	Ala	Phe				
385					390					395					400				
Gln	Ala	Glu	Asp	Asp	Ala	Asp	Asp	Xaa	Phe	Ser	Pro	Trp	Gln	Glu	Gly				
				405				410						415					
Thr	Asn	Pro	Xaa	Leu	Xaa	Xaa	Val	Pro	Asn	Pro	Val	Phe	Gly	Ser	Asp				
			420					425					430						

Thr Phe Cys Glu Pro Phe Asp Asp Ser Leu Leu Glu Glu Asp Phe Pro  
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Asp Thr Gln Arg Ile Leu Thr Val Lys  
 450 455

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 <212> PRT  
 <213> Homo sapiens

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 Ala Ala Gly Val Tyr His Arg Ala Arg Ser Gly Lys Tyr Lys Thr Tyr  
 20 25 30  
 Ala Ala Lys Ala Val Cys Gly Gly His Ala Thr Tyr Lys Ala Ala Arg  
 35 40 45  
 Lys Gly His Val Cys Ala Ala Gly Trp Met Ala Lys Gly Arg Val Gly  
 50 55 60  
 Tyr Val Lys Gly Asn Cys Gly Gly Lys Thr Gly Asp Tyr Gly Arg Asn  
 65 70 75 80  
 Arg Ser Arg Trp Asp Ala Tyr Cys Tyr Asn His Ala Lys Cys Gly Gly  
 85 90 95  
 Val Thr Asp Lys Arg Lys Ser Gly Asn Tyr Asp Asn Cys Tyr Trp His  
 100 105 110  
 Arg Lys Tyr Gly Arg His Ser Asp Asp Asp Asp Gly Cys Ala Asp Tyr  
 115 120 125  
 Val Tyr Asp Ser Tyr Asp Asp Val His Gly Val Gly Arg Tyr Cys Gly  
 130 135 140  
 Asp Asp Asp Ser Thr Gly Asn Val Met Thr Lys Ser Asp Ala Ser Val  
 145 150 155 160  
 Thr Ala Gly Gly Lys Tyr Val Ala Met Asp Val Ser Lys Ser Ser Gly  
 165 170 175  
 Lys Asn Thr Ser Thr Thr Ser Thr Gly Asn Lys Asn Ala Gly Arg Ser  
 180 185 190

His

<210> 7  
 <211> 985  
 <212> DNA  
 <213> Homo sapiens

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 <222> (118)..(984)

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cctgggggacg tttgccctgg ggccccagcc tggccccgggt caccctggca tgaggag 117

atg ggc ctg ttg ctc ctg gtc cca ttg ctc ctg ctg ccc ggc tcc tac 165
Met Gly Leu Leu Leu Val Pro Leu Leu Leu Leu Pro Gly Ser Tyr
1 5 10 15

gga ctg ccc ttc tac tac ggc ttc tac tac tcc aac agc gcc aac gac 213
Gly Leu Pro Phe Tyr Tyr Gly Phe Tyr Tyr Ser Asn Ser Ala Asn Asp
20 25 30

cag aac cta ggc aac ggt cat ggc aaa gac cta cnt aat gga gtg aag 261
Gln Asn Leu Gly Asn Gly His Gly Lys Asp Leu Xaa Asn Gly Val Lys
35 40 45

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ctg gtg gtg gag aca ccc gag gag acc ctg ttc acc tac caa ggg gcc	309
Leu Val Val Glu Thr Pro Glu Glu Thr Leu Phe Thr Tyr Gln Gly Ala	
50 55 60	
agt gtg atc ctg ccc tgc cgc tac cgc tac gag ccg gcc ctg gtc tcc	357
Ser Val Ile Leu Pro Cys Arg Tyr Arg Tyr Glu Pro Ala Leu Val Ser	
65 70 75 80	
ccg cgg cgt gtg cgt gtc aaa tgg tgg aag ctg tcg gag aac ggg gcc	405
Pro Arg Arg Val Arg Val Lys Trp Trp Lys Leu Ser Glu Asn Gly Ala	
85 90 95	
cca gag aag gac gtg ctg gtg gcc atc ggg ctg agg cac cgc tcc ttt	453
Pro Glu Lys Asp Val Leu Val Ala Ile Gly Leu Arg His Arg Ser Phe	
100 105 110	
ggg gac tac caa ggc cgc gtg cac ctg cgg cag gac aaa gag cat gac	501
Gly Asp Tyr Gln Gly Arg Val His Leu Arg Gln Asp Lys Glu His Asp	
115 120 125	
gtc tcg ntg gag atc cag gnt ctg cgg ctg gag gac tat ggg cgt tac	549
Val Ser Xaa Glu Ile Gln Xaa Leu Arg Leu Glu Asp Tyr Gly Arg Tyr	
130 135 140	
cgc tgt gag gtc atn gac ggg ctg gag gat gaa agc ggt ctg gtg gag	597
Arg Cys Glu Val Xaa Asp Gly Leu Glu Asp Glu Ser Gly Leu Val Glu	
145 150 155 160	
ctg gag ctg cgg ggt gtg gtc ttt cct tac cag tcc ccc aac ggg cgc	645
Leu Glu Leu Arg Gly Val Val Phe Pro Tyr Gln Ser Pro Asn Gly Arg	
165 170 175	
tac cag ttc aac ttc cac gag ggc cag cag gtc tgt gca gag cag gct	693
Tyr Gln Phe Asn Phe His Glu Gly Gln Gln Val Cys Ala Glu Gln Ala	
180 185 190	
gcg gtg gtg gcc tcc ttt gag cag ctc ttc cgg gcc tgg gag gag ggc	741
Ala Val Val Ala Ser Phe Glu Leu Phe Arg Ala Trp Glu Glu Gly	
195 200 205	
ctg gac tgg tgc aac gcg ggc tgg ctg cag gat gcc acg gtg cag tac	789
Leu Asp Trp Cys Asn Ala Gly Trp Leu Gln Asp Ala Thr Val Gln Tyr	
210 215 220	
ccc atc atg ttg ccc cgg cag ccc tgc ggt ggc ccg gac ctg gca cct	837
Pro Ile Met Leu Pro Arg Gln Pro Cys Gly Pro Asp Leu Ala Pro	
225 230 235 240	
ggc gtg cga agc tac ggc ccc cgc cac cgc cgc ctg cac cgc tat gat	885
Gly Val Arg Ser Tyr Gly Pro Arg His Arg Arg Leu His Arg Tyr Asp	
245 250 255	
gta ttc tgc ttc gct act gcc ctc arg ggg cgg gtg tac tac ctg gan	933
Val Phe Cys Phe Ala Thr Ala Leu Xaa Gly Arg Val Tyr Tyr Leu Xaa	
260 265 270	
cac cct gag aan ctg acn ctg aca naa gca agg gaa gcc tgc caa gaa	981
His Pro Glu Xaa Leu Xaa Leu Thr Xaa Ala Arg Glu Ala Cys Gln Glu	
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Lys	

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Gly Leu Pro Phe Tyr Tyr Gly Phe Tyr Tyr Ser Asn Ser Ala Asn Asp
          20             25             30
Gln Asn Leu Gly Asn Gly His Gly Lys Asp Leu Xaa Asn Gly Val Lys
      35             40             45
Leu Val Val Glu Thr Pro Glu Thr Leu Phe Thr Tyr Gln Gly Ala
  50             55             60

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Ser Val Ile Leu Pro Cys Arg Tyr Arg Tyr Glu Pro Ala Leu Val Ser  
 65 70 75 80  
 Pro Arg Arg Val Arg Val Lys Trp Trp Lys Leu Ser Glu Asn Gly Ala  
 85 90 95  
 Pro Glu Lys Asp Val Leu Val Ala Ile Gly Leu Arg His Arg Ser Phe  
 100 105 110  
 Gly Asp Tyr Gln Gly Arg Val His Leu Arg Gln Asp Lys Glu His Asp  
 115 120 125  
 Val Ser Xaa Glu Ile Gln Xaa Leu Arg Leu Glu Asp Tyr Gly Arg Tyr  
 130 135 140  
 Arg Cys Glu Val Xaa Asp Gly Leu Glu Asp Glu Ser Gly Leu Val Glu  
 145 150 155 160  
 Leu Glu Leu Arg Gly Val Val Phe Pro Tyr Gln Ser Pro Asn Gly Arg  
 165 170 175  
 Tyr Gln Phe Asn Phe His Glu Gly Gln Gln Val Cys Ala Glu Gln Ala  
 180 185 190  
 Ala Val Val Ala Ser Phe Glu Gln Leu Phe Arg Ala Trp Glu Glu Gly  
 195 200 205  
 Leu Asp Trp Cys Asn Ala Gly Trp Leu Gln Asp Ala Thr Val Gln Tyr  
 210 215 220  
 Pro Ile Met Leu Pro Arg Gln Pro Cys Gly Gly Pro Asp Leu Ala Pro  
 225 230 235 240  
 Gly Val Arg Ser Tyr Gly Pro Arg His Arg Arg Leu His Arg Tyr Asp  
 245 250 255  
 Val Phe Cys Phe Ala Thr Ala Leu Xaa Gly Arg Val Tyr Tyr Leu Xaa  
 260 265 270  
 His Pro Glu Xaa Leu Xaa Leu Thr Xaa Ala Arg Glu Ala Cys Gln Glu  
 275 280 285

Lys

<210> 9

<211> 355

<212> PRT

<213> Homo sapiens

<400> 9

Met Thr Ser Leu Leu Phe Leu Val Leu Ile Ser Val Cys Trp Ala Glu  
 1 5 10 15  
 Pro His Pro Asp Asn Ser Ser Leu Glu His Glu Arg Ile Ile His Ile  
 20 25 30  
 Gln Glu Glu Asn Gly Pro Arg Leu Val Val Ala Glu Gln Ala Lys  
 35 40 45  
 Ile Phe Ser Gln Arg Gly Gly Asn Val Thr Leu Pro Cys Lys Phe Tyr  
 50 55 60  
 His Glu His Thr Ser Thr Ala Gly Ser Gly Thr His Lys Ile Arg Val

65	70					75					80				
Lys Trp Thr	Lys	Leu	Thr	Ser	Asp	Tyr	Leu	Lys	Glu	Val	Asp	Val	Phe		
	85						90					95			
Val Ala Met	Gly	His	His	Arg	Lys	Ser	Tyr	Gly	Lys	Tyr	Gln	Gly	Arg		
	100					105					110				
Val Phe Leu	Arg	Glu	Ser	Ser	Glu	Asn	Asp	Ala	Ser	Leu	Ile	Ile	Thr		
	115				120					125					
Asn Ile Met	Leu	Glu	Asp	Tyr	Gly	Arg	Tyr	Lys	Cys	Glu	Val	Ile	Glu		
	130			135					140						
Gly Leu Glu	Asp	Asp	Thr	Ala	Val	Val	Ala	Leu	Asn	Leu	Glu	Gly	Val		
	145		150					155					160		
Val Phe Pro	Tyr	Ser	Pro	Arg	Leu	Gly	Arg	Tyr	Asn	Leu	Asn	Phe	His		
		165					170					175			
Glu Ala Gln	Gln	Ala	Cys	Leu	Asp	Gln	Asp	Ser	Ile	Ile	Ala	Ser	Phe		
	180					185					190				
Asp Gln Leu	Tyr	Glu	Ala	Trp	Arg	Ser	Gly	Leu	Asp	Trp	Cys	Asn	Ala		
	195				200					205					
Gly Trp Leu	Ser	Asp	Gly	Ser	Val	Gln	Tyr	Pro	Ile	Thr	Lys	Pro	Arg		
	210			215					220						
Glu Pro Cys	Gly	Gly	Lys	Asn	Thr	Val	Pro	Gly	Val	Arg	Asn	Tyr	Gly		
	225		230					235					240		
Phe Trp Asp	Lys	Glu	Arg	Ser	Arg	Tyr	Asp	Val	Phe	Cys	Phe	Thr	Ser		
		245					250					255			
Asn Phe Asn	Gly	Arg	Phe	Tyr	Tyr	Leu	Ile	His	Pro	Thr	Lys	Leu	Thr		
	260					265					270				
Tyr Asp Glu	Ala	Val	Gln	Ala	Cys	Leu	Lys	Asp	Gly	Ala	Gln	Ile	Ala		
	275				280					285					
Lys Val Gly	Gln	Ile	Phe	Ala	Ala	Trp	Lys	Leu	Leu	Gly	Tyr	Asp	Arg		
	290			295				300							
Cys Asp Ala	Gly	Trp	Leu	Ala	Asp	Gly	Ser	Val	Arg	Tyr	Pro	Ile	Ser		
	305		310					315					320		
Arg Pro Arg	Lys	Arg	Cys	Ser	Pro	Asn	Glu	Ala	Ala	Val	Arg	Phe	Val		
		325					330					335			
Gly Phe Pro	Asp	Lys	Lys	His	Lys	Leu	Tyr	Gly	Val	Tyr	Cys	Phe	Arg		
	340					345					350				
Ala Tyr Asn															
	355														

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gccagatgct ccagaaggc cacgaaggtc tcctgcagct gccagaaggc atacaaaggc 120
gacgggcaca gctgcacaga gatagacccc tgtgcagacg gccttaacgg aggggtgtcac 180
gagcacgcc cctgtaag atg aca ggc ccg ggc aag cac aag tgt gag tgt 231
          Met Thr Gly Pro Gly Lys His Lys Cys Glu Cys

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	1	5	10	
aaa agt cac tat gtc gga gat ggg ctg aac tgt gag ccg gag cag ctg				279
Lys Ser His Tyr Val Gly Asp Gly Leu Asn Cys Glu Pro Glu Gln Leu	15	20	25	
ccc att gac cgc tgc tta cag gac aat ggg cag tgc cat gca gac gcc				327
Pro Ile Asp Arg Cys Leu Gln Asp Asn Gly Gln Cys His Ala Asp Ala	30	35	40	
aaa tgt gtc gac ctc cac ttc cag gat acc act gtt ggg gtg ttc cat				375
Lys Cys Val Asp Leu His Phe Gln Asp Thr Thr Val Gly Val Phe His	45	50	55	
cta cgc tcc cca ctg ggc cag tat aag ctg acc ttt gac aaa gcc aga				423
Leu Arg Ser Pro Leu Gly Gln Tyr Lys Leu Thr Phe Asp Lys Ala Arg	60	65	70	75
gag gcc tgt gcc aac gaa gct gcg acc atg gca acc tac aac cag ctc				471
Glu Ala Cys Ala Asn Glu Ala Ala Thr Met Ala Thr Tyr Asn Gln Leu	80	85	90	
tcc tat nnc cag aag gcc aag tac cac ctg tgc tca gca ggc tgg ctg				519
Ser Tyr Xaa Gln Lys Ala Lys Tyr His Leu Cys Ser Ala Gly Trp Leu	95	100	105	
gag acc ggg cgg gtt gcc tac ccc aca gcc ttc gcc tcc cag aac tgt				567
Glu Thr Gly Arg Val Ala Tyr Pro Thr Ala Phe Ala Ser Gln Asn Cys	110	115	120	
ggc tct ggt gtg gtt ggg ata gtg gac tat gga cct aga ccc aac aag				615
Gly Ser Gly Val Val Gly Ile Val Asp Tyr Gly Pro Arg Pro Asn Lys	125	130	135	
agt gaa atg tgg gat gtc ttc tgc tat cgg atg aaa gat gtg aac tgc				663
Ser Glu Met Trp Asp Val Phe Cys Tyr Arg Met Lys Asp Val Asn Cys	140	145	150	155
acc tnc aag gtg ggc tat gtg gga gat ggc ttc tca tac agt ggg aac				711
Thr Xaa Lys Val Gly Tyr Val Gly Asp Gly Phe Ser Tyr Ser Gly Asn	160	165	170	
ctg ctg cag gtc ctg atg tcc ttc ccc tca ctc aca aac ttc ctg acg				759
Leu Leu Gln Val Leu Met Ser Phe Pro Ser Leu Thr Asn Phe Leu Thr	175	180	185	
gaa gtg ctg gcc tat tcc aac agc tca gct cga ggc cgt gca ttt cta				807
Glu Val Leu Ala Tyr Ser Asn Ser Ser Ala Arg Gly Arg Ala Phe Leu	190	195	200	
gaa cac ctg act gac ctg tcc atc cgc ggc acc ctc ttt gtn cca cag				855
Glu His Leu Thr Asp Leu Ser Ile Arg Gly Thr Leu Phe Val Pro Gln	205	210	215	
aac agt ggg ctg ggg gag aat gag acc ttg tct ggg cgg gac atc gag				903
Asn Ser Gly Leu Gly Glu Asn Glu Thr Leu Ser Gly Arg Asp Ile Glu	220	225	230	235
cac cac ctc gcc aat gtc agc atg ttt ttc tac aat gac ctt gtc aat				951
His His Leu Ala Asn Val Ser Met Phe Phe Tyr Asn Asp Leu Val Asn	240	245	250	
ggc acc acc ctg caa acg agg ctg gga agc aag ctg ctc atc act gac				999
Gly Thr Thr Leu Gln Thr Arg Leu Gly Ser Lys Leu Leu Ile Thr Asp				

	255		260		265	
	aga cag gac cca ctc cac ccg acg gag acc agg tgt gtt gat gga aga					1047
	Arg Gln Asp Pro Leu His Pro Thr Glu Thr Arg Cys Val Asp Gly Arg					
	270		275		280	
	gac act ctg gag tgg gac atc tgt gcc tcc aat ggg atc aca cat gtc					1095
	Asp Thr Leu Glu Trp Asp Ile Cys Ala Ser Asn Gly Ile Thr His Val					
	285		290		295	
	att tcc agg yct tta aaa gca ccc cct gcc ccc gtg acc ttg ncc cac					1143
	Ile Ser Arg Xaa Leu Lys Ala Pro Pro Ala Pro Val Thr Leu Xaa His					
	300		305		310	315
	act ggn ttg gga gna ggg atc ttc tnt gnc atc atc ctg gtg act ggg					1191
	Thr Gly Leu Gly Xaa Gly Ile Phe Xaa Xaa Ile Ile Leu Val Thr Gly					
		320		325		330
	gct gtt gcc ttg gct gct tac tcc tac ttt cgg ata aac cgg aaa aca					1239
	Ala Val Ala Leu Ala Ala Tyr Ser Tyr Phe Arg Ile Asn Arg Lys Thr					
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	atc ggc ttc can cat ttt ga					1259
	Ile Gly Phe Xaa His Phe					
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 <213> Homo sapiens

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<220>  
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          35          40          45

His Phe Gln Asp Thr Thr Val Gly Val Phe His Leu Arg Ser Pro Leu
          50          55          60

Gly Gln Tyr Lys Leu Thr Phe Asp Lys Ala Arg Glu Ala Cys Ala Asn
          65          70          75          80

Glu Ala Ala Thr Met Ala Thr Tyr Asn Gln Leu Ser Tyr Xaa Gln Lys
          85          90          95

Ala Lys Tyr His Leu Cys Ser Ala Gly Trp Leu Glu Thr Gly Arg Val
          100          105          110

Ala Tyr Pro Thr Ala Phe Ala Ser Gln Asn Cys Gly Ser Gly Val Val
          115          120          125

Gly Ile Val Asp Tyr Gly Pro Arg Pro Asn Lys Ser Glu Met Trp Asp
          130          135          140

Val Phe Cys Tyr Arg Met Lys Asp Val Asn Cys Thr Xaa Lys Val Gly
          145          150          155          160

Tyr Val Gly Asp Gly Phe Ser Tyr Ser Gly Asn Leu Leu Gln Val Leu
          165          170          175

Met Ser Phe Pro Ser Leu Thr Asn Phe Leu Thr Glu Val Leu Ala Tyr
          180          185          190

Ser Asn Ser Ser Ala Arg Gly Arg Ala Phe Leu Glu His Leu Thr Asp
          195          200          205

Leu Ser Ile Arg Gly Thr Leu Phe Val Pro Gln Asn Ser Gly Leu Gly
          210          215          220

Glu Asn Glu Thr Leu Ser Gly Arg Asp Ile Glu His His Leu Ala Asn
          225          230          235          240

Val Ser Met Phe Phe Tyr Asn Asp Leu Val Asn Gly Thr Thr Leu Gln
          245          250          255

Thr Arg Leu Gly Ser Lys Leu Leu Ile Thr Asp Arg Gln Asp Pro Leu
          260          265          270

His Pro Thr Glu Thr Arg Cys Val Asp Gly Arg Asp Thr Leu Glu Trp
          275          280          285

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Asp Ile Cys Ala Ser Asn Gly Ile Thr His Val Ile Ser Arg Xaa Leu  
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 305 310 315 320  
 Gly Ile Phe Xaa Xaa Ile Ile Leu Val Thr Gly Ala Val Ala Leu Ala  
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Phe

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 Gln Ala Ala Gly Val Tyr His Arg Glu Ala Arg Ala Gly Arg Tyr Lys  
 35 40 45  
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 50 55 60  
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 65 70 75 80  
 Val Cys Ala Ala Gly Trp Met Ala Lys Gly Arg Val Gly Tyr Pro Ile  
 85 90 95  
 Val Lys Pro Gly Pro Asn Cys Gly Phe Gly Lys Thr Gly Ile Ile Asp  
 100 105 110  
 Tyr Gly Ile Arg Leu Asn Arg Ser Glu Arg Trp Asp Ala Tyr Cys Tyr  
 115 120 125  
 Asn Pro His Ala Lys Glu Cys Gly Gly Val Phe Thr Asp Pro Lys Arg  
 130 135 140  
 Ile Phe Lys Ser Pro Gly Phe Pro Asn Glu Tyr Asp Asp Asn Gln Val  
 145 150 155 160  
 Cys Tyr Trp His Ile Arg Leu Lys Tyr Gly Gln Arg Ile His Leu Ser  
 165 170 175  
 Phe Leu Asp Phe Asp Leu Glu His Asp Pro Gly Cys Leu Ala Asp Tyr  
 180 185 190  
 Val Glu Ile Tyr Asp Ser Tyr Asp Asp Val His Gly Phe Val Gly Arg  
 195 200 205  
 Tyr Cys Gly Asp Glu Leu Pro Glu Asp Ile Ile Ser Thr Gly Asn Val  
 210 215 220  
 Met Thr Leu Lys Phe Leu Ser Asp Ala Ser Val Thr Ala Gly Gly Phe  
 225 230 235 240

Gln Ile Lys Tyr Val Thr Val Asp Pro Ala Ser Lys Ser Ser Gln Ala  
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